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ABSTRACT

Australia's agriculture, forestry, and fishing industry represents about 5% of the nation's total employment and growth in the last 10 years has averaged only about 0.3% per year. In 1996, it was estimated that 4.7% of government-funded training was directed toward this industry. A 1997 employer satisfaction survey indicated that 11% of enterprises in this sector employed recent vocational education and training (VET) graduates, fourth highest among all industries. A relatively high 58% of technical and further education graduates had received employer support during their last semester of study, and 75% of VET graduates rated their studies as either highly relevant or of some relevance. Nearly 68% of this industry's workers lack qualifications beyond high school and more than half did not complete the highest level of secondary school. Approximately 77% of VET graduates in land and marine resources or animal husbandry were employed. (An appendix contains four tables of statistics: shifts in employment in various industries in Australia; numbers of persons employed in various occupations in the agriculture, forestry, and fishing industry from 1987-1996; and educational attainment of persons in occupations within the industry.) (KC)

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Industry training monograph

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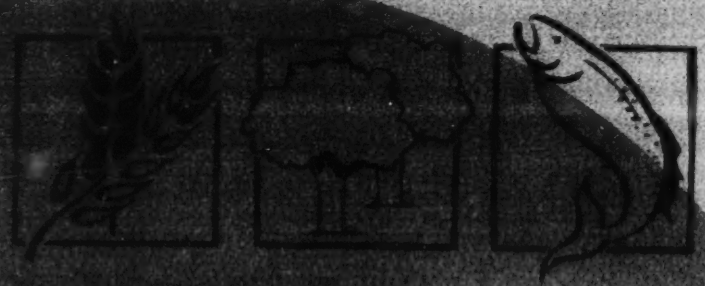
Agriculture, forestry and fishing



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Industry training monograph

Agriculture, forestry and fishing

1998

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Preface

THE AGRICULTURE, FORESTRY and fishing industry training monograph is one of a series of monographs which has been designed to provide readers with an overview of occupational trends and the current training effort in each industry in Australia.

The monograph analyses data at the major Australian and New Zealand Standard Industry Classification (ANZSIC) industry division level, given that it is at this level most data are collected and disseminated. The monograph addresses:

- recent employment trends
- recent occupational trends in key skills areas
- current training arrangements, particularly training levels and outputs

The monographs bring together for the first time a range of survey data from the Australian Bureau of Statistics (ABS), together with graduate destination, employer satisfaction with training and other training data compiled for the Australian National Training Authority (ANTA) by the National Centre for Vocational Education Research (NCVER).

I would like to thank Tom Dumbrell for preparing these monographs and I would also like to acknowledge John Ray's contribution to the analysis of employment and occupation data.

NCVER acknowledges ANTA's significant contribution to the cost of this monograph in sponsoring its publication.

I hope that the material in this publication will be of interest to Australia's vocational, education and training (VET) sector. In particular the document is designed for industry decision-makers, policy-makers, teachers and trainers, researchers and students with an interest in VET.

Readers who are interested in more information about training markets or other areas of VET research are referred to the NCVER's research database, VOCED. Printed and diskette versions of VOCED can be obtained from NCVER (ph +61 8 8333 8400) or it can be accessed directly on the world wide web at the following address:

<http://www.ncver.edu.au/voced.htm>

Chris Robinson, National Centre for Vocational Education and Research Ltd

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The agriculture, forestry and fishing industry in Australia

Overview

THE AGRICULTURE, FORESTRY and fishing industry accounts for a little over 5% of total employment in Australia. During 1996 the number of persons employed in the sector averaged about 420 000 persons (Australian Bureau of Statistics [ABS] cat.6203.0, 1996). Growth in employment over the last ten years has been low, averaging only about 0.3% a year. Over that period the number of persons employed in the sector grew by about 12 400, contributing a little over 1% to national employment growth. There are about 110 000 businesses in this sector, with around 92% of them classified as small businesses according to the ABS.

The Australian Bureau of Agricultural and Resource Economics (ABARE) statistics show about 115 000 farms across Australia, defined on a different basis to the ABS business statistics. ABARE divides farms into four categories: broadacre (about 70 000 farms); dairy (about 14 000); horticulture (about 16 000); and other (about 14 000). The agriculture, forestry and fishing industry contributes about $13.5 billion to gross product in Australia. It is estimated that about 8000 are employed in forestry operations.

Over the last decade the number of farms in Australia has been declining at a rate of about 1.3% a year, with the greatest rate of decline being in the dairy industry. While the number of farms has fallen, the size of farms has been growing, through amalgamations, over this period. A major reason for the decline in farm numbers and the subsequent amalgamation of farms has been a general trend to falling commodity prices. The number of establishments in the horticultural sector has remained constant over the last decade.

The rate of decline in farm numbers has been greatest in the south-east and the south-west of the continent. The number of farms in the Northern Territory actually rose over the decade, as did the number of farms in the Kimberley region of Western Australia.

The rise of incomes in Asia over the last ten years has assisted the growth of exports of most Australian commodities. In agriculture, the share of Australian

exports to South-East Asia more than doubled over the period between 1988–1989 and 1996–1997.[1]

The impact of the Asian currency difficulties will contribute to a marginal decline in the value of exports of agricultural products in the 1997–1998 year. Over the next five years the volume of agricultural production is forecast to rise by about 9.5%.[2] Developments in trade liberalisation will determine the longer-term growth outlook for the agriculture sector.

Employers in the agriculture sector were not included in the ABS employer training expenditure surveys, so data are not available on the industry's contribution to training. In 1996 the Australian National Training Authority (ANTA) estimated that about 4.7% of government-funded training effort was directed towards primary industry, a little below the industry's overall share of employment.

The agriculture, forestry and fishing industry is, nevertheless, a significant employer of vocational education and training (VET) graduates. At the 1997 employer satisfaction survey (ESS) 11% of establishments in the sector employed recent VET graduates, the fourth highest level of all industries.[3] Agriculture sector employers showed relatively high levels of satisfaction with VET providers. The technical and further education (TAFE) graduate destination survey for 1997 (GDS) found that a relatively high 58% (compared to 51% in all industries) of graduates working in the agriculture sector had received some form of employer support during their last semester of study.[4] About 75% of graduates working in the industry rated their studies as either highly relevant or of some relevance. This was a slightly below-average rating compared with all industries.

Although employment in the sector has fluctuated over the last decade, since 1994 there has been a consistent increase in employment. Given the decline in Asian markets in recent months, it seems unlikely that employment growth can be sustained, at least over the short term. It could be expected that employment will, however, remain in the range experienced over the last decade.

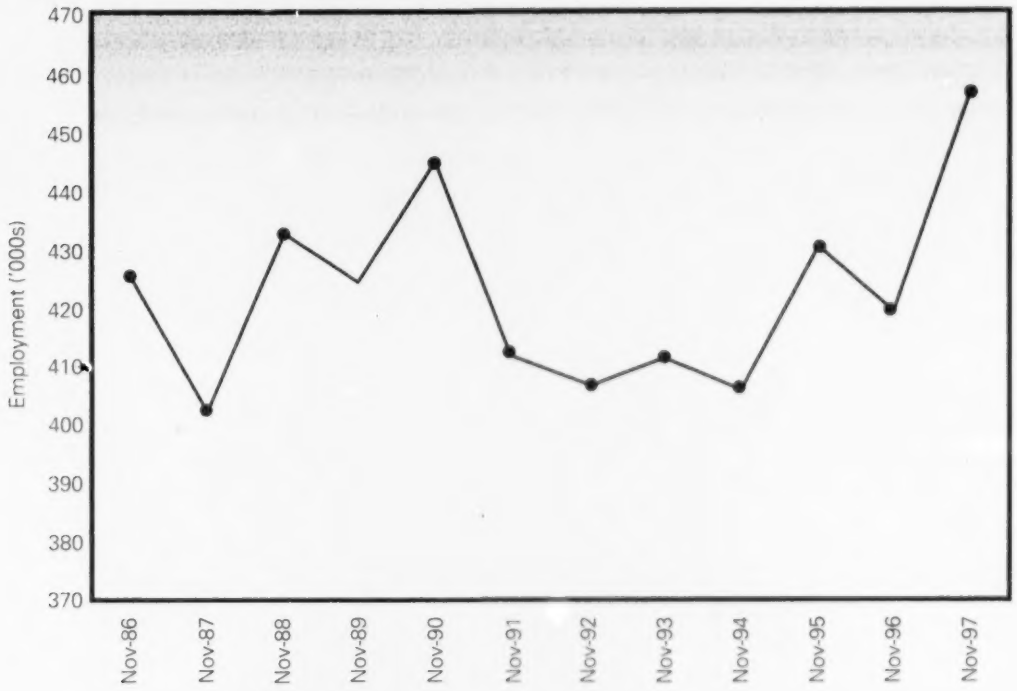
2

An industry snapshot

As noted above, the agriculture, forestry and fishing industry employed about 420 000 persons on average during 1996 throughout Australia, making up a little over 5% of the national workforce. By November 1997 this number had grown to almost 458 000. The industry is eighth out of the 17 industry sectors in terms of total employment. Over the last decade and, in fact, for several decades, the level of employment in the industry has been growing very slowly.

[1] ABARE, *Outlook 98* address by Brian Fisher, executive director, vol.1
[2] ABARE, ibid
[3] NCVER, *Employer satisfaction with vocational education and training 1997*
[4] NCVER, TAFE GDS 1997

Chart 1.1: Employment in agriculture, forestry and fishing, Australia, 1986–1997 (ABS labour force survey)



Source: ABS, *Labour force, Australia*, cat.6203.0, 1986–1997

Since the early 1970s the rural sector's share of gross domestic product (GDP) in Australia has fallen from 5.8% to around 4.4%. Across all Organisation for Economic Co-operation and Development (OECD) countries the same trend has been evident. However, in most other OECD countries the fall has been greater, with the average GDP share for rural industries in all OECD countries now around 2.9%. In other words, Australia is still a nation more dependent upon the agriculture sector than most other OECD countries. In 1994–1995, agriculture accounted for 8.4% of the total exports of goods and services, amounting to $6.9 billion.[5]

3

Since the early 1970s Australian agriculture sector industries have shown above-average growth in both labour and capital productivity. According to the Industry Commission, growth in labour productivity in Australian agriculture, using total OECD labour productivity growth across all industries as a base of 1.0, has been 1.19. This compares with total labour productivity growth in all Australian industries over that period of 0.9, below the overall OECD average. Capital productivity in Australian agriculture over the same period rose by 1.2 using the same OECD base of 1.0, compared with total capital productivity growth in all Australian industry of 0.83, again well below the total OECD average.

[5] Industry Commission, *The changing of Australian manufacturing*, 1996

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Agriculture is now a less significant, though still important, component of Australian commodity exports. The largest commodity export earner in this sector in 1997–1998 is expected to be wool, with exports expected to be valued at about $4 billion dollars. This places it third in value, behind coal (about $9 billion) and gold (about $5 billion). Other important agricultural exports include wheat, in eighth place, with an expected worth of about $3 billion, beef and veal ninth, at about $2.5 billion, and dairy tenth, at a little under $2 billion.

Falling terms of trade since the early 1950s have reduced the profitability of the sector, although there is an expectation that farm incomes will rise in the medium term. In 1997–1998 average cash income per farm is forecast to be $55 200.

Within the broad industry sector, most employment occurs in the agriculture sub-division, accounting for about 401 000 persons or 88% of the sector's total. Services to agriculture is the next largest source of employment within the sector, accounting for around 26 000 jobs or about 6% of the sector. Forestry and logging provided employment nationally for around 13 400 persons (3% of the sector), while fishing accounted for around 17 000 jobs (or 4.3% of the sector).

Table 1.1: Employment ('000s) in agriculture, forestry and fishing by sub-division, by gender and type of employment ('000s), Australia, November 1997

Industry sub-division	Males	Females	Full-time	Part-time	Total
Agriculture	*274.6*	*126.6*	*309.7*	*91.5*	*401.2*
Horticulture and fruit growing	56.4	30.2	62.8	23.7	86.5
Grain, sheep and beef cattle farming	158.2	60.2	172.6	45.7	218.4
Dairy cattle farming	24.5	14.3	31.3	7.5	38.8
Poultry farming	6.1	6.1	7.2	4.9	12.1
Other livestock farming	12.8	10.3	18.3	4.9	23.2
Other crop growing	16.8	5.5	17.5	4.8	22.3
Services to agriculture; hunting and trapping	*21.3*	*4.9*	*22.4*	*3.8*	*26.2*
Services to agriculture	21.0	4.9	22.1	3.8	25.9
Hunting and trapping	0.3*	0.0*	0.3*	0.0*	0.3*
Forestry and logging	*11.1*	*2.3**	*11.9*	*1.5**	*13.4*
Commercial fishing	*14.0*	*3.0**	*13.6*	*3.5**	*17.1*
Marine fishing	10.1	2.0*	9.6	2.5*	12.1
Aquaculture	3.9	1.0*	4.0	0.9*	4.9
Total	**321.2**	**136.8**	**357.6**	**100.2**	**457.9**

Note: *Subject to sampling variability too high for most practical uses

Source: ABS, *Labour force, Australia*, cat.6203.0, November 1997

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In the forestry sub-sector, exports of Australian forest products, including woodchips, have risen consistently over the last decade. Much of the employment associated with forestry, such as in wood and wood products and in paper and paper products, is included by the ABS within the manufacturing sector.

The fishing industry is comprised of the traditional area of offshore commercial fishing together with the emerging aquaculture sector. Industry sources claim that in addition to the employment in traditional fishing, there are now about 10 000 persons employed in the aquaculture sector. It appears that this employment is not included within the agriculture, forestry and fishing sector within the ABS classification.

Over 78% of employees (or about 358 000 persons) in the industry work full time, with males representing about 80% of all full-time workers. Females account for around 67% of the 100 000 part-timers in the industry. Overall, males account for about 70% of the workers in this sector, making it a substantially male-dominated industry. Across all industry sectors, males represent about 57% of all workers.

Along with the characteristics outlined above, there are two other features that distinguish the workforce in this sector—its age, and its high level of Australian-born workers, representing 90% of its workers. The following table summarises both these features and compares them with the workforce as a whole.

Table 1.2: Employment in agriculture, forestry and fishing by age and birthplace

	Age group ('000s)						Born in Australia	Total
	15–19	20–24	25–34	35–44	45–54	55+		
Agriculture, forestry and fishing	24.9	35.9	87.2	98.4	99.6	111.8	412.5	457.9
%	5%	8%	19%	21%	22%	24%	90%	100%
Total employment	**586.1**	**975.9**	**2147.6**	**2178.7**	**1796.5**	**836.6**	**6472.9**	**8521.5**
%	7%	11%	25%	26%	21%	10%	76%	100%

Source: ABS, *Labour force, Australia*, cat.6203.0, November 1997

The sector has close to half, 46%, of its workforce aged over 45, compared with just 31% of the workforce across all industries in these age groups. The low skill profile referred to elsewhere in this monograph might be, in part, a product of this age profile, with older workers generally having had less opportunity to access education and training.

Nevertheless, given the overall deficit of formal qualifications and the expected losses through age-based retirement, there appears to be a looming skill shortage in this sector. Further analysis of new entrants to the industry and of the skills/qualifications of younger persons in the industry appear to be a research priority.

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Occupational composition

While the occupation 'farmers and farm managers' is one of the largest occupations, it has declined in numbers over the last ten years by more than any other occupation, losing around 20 000 persons. By contrast, the category of 'farmhands and assistants' has actually grown over the same period at an annual rate of about 1.6%, or by 13 700 positions. Together, these two occupations account for about 80% of employment in this industry sector. This change reflects the decline in the number of farms, through aggregation of small farms into larger units, with fewer owners.

Table 1.3: Employment in agriculture, forestry and fishing by occupational group ('000s)

Occupation group	Males	Females	Persons
Managers and administrators	186.7	78.7	265.4
Professionals	10.5	0.7*	11.2
Associate professionals	2.9*	2.9*	5.8
Tradespersons and related	15.6	3.1*	18.7
Advanced clerical and service workers	0.3*	7.8	8.1
Intermediate clerical, sales and service workers	4.4	6.2	10.6
Intermediate production and transport workers	27.3	1.5*	28.7
Basic clerical, sales and service workers	0.7*	0.9*	1.6*
Labourers and related workers	72.9	35.0	107.9
Total	**321.1**	**136.8**	**457.9**

Note: *Subject to sampling variability too high for most practical uses

Source: ABS, *Labour force, Australia*, cat.6203.0, November 1997

The occupational structure reflects the ownership characteristics and the qualifications profile of the industry. Table 1.3 summarises the broad occupational groups in the industry as at November 1997.

Qualifications profile

Agriculture, forestry and fishing is the industry with the lowest skill profile in Australia, with nearly 68% of workers in the industry lacking a formal post-school qualification. Full details of educational attainment by occupation from the 1996 Census are provided in the appendix in tables A1.3 and A1.4.

More than half of the workforce (54%), in fact, did not complete the highest level of secondary schooling, again the highest proportion within any industry.

The following table summarises the educational attainment of the workforce in the industry as at May 1997. It shows that at each level of qualification, except for the basic vocational qualification, the industry is more lowly qualified than the workforce in total. Around 6% of the agriculture, forestry and fishing industry hold a university degree or higher qualification. Across all industries the figure is almost three times this at 17.2%.

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Table 1.4: **Qualifications of workers in agriculture, forestry and fishing, May 1997, percentage distribution**

	Bachelor's degree or higher	Diploma/ associate diploma	Skilled vocational	Basic vocational	Without post-school qualification
	%	%	%	%	%
Agriculture, forestry and fishing	5.9	6.5	7.3	10.9	67.8
Total industry	**17.2**	**9.0**	**12.6**	**9.4**	**49.4**

Source: ABS, *Transition from education to work*, cat.6227.0, May 1997

A high proportion of those in the industry are classified as either employers or 'own-account' workers. While only about 14% of those in the total labour market are classified as employers or own-account workers, in agriculture, forestry and fishing the percentage is over 53%.

This high level of small business presence, and the long average hours worked in the industry, no doubt contribute to the low level of formal qualifications held by the workforce. Individuals working long hours and running their own business are much less likely to have time available for attendance at formal training courses. Many organisations, public and private, provide short courses or extension courses in the sector in areas such as the use of farm chemicals, the use of veterinary products or the operation of new machinery. Whether such courses are addressing all the training needs of the sector is unclear.

Occupational trends and skills shortages

Between 1987 and 1996 employment in agriculture, forestry and fishing grew by about 3%. Jobs in the professional, para-professional, clerical, plant operator/driver and labouring areas rose, while management and trades jobs declined. The largest rise in numbers occurred in the labouring area, rising from 106 800 persons employed to 127 600, or by nearly 20%. Conversely, management jobs fell by nearly 8%, probably reflecting the decline in individual farm owners and the amalgamation of smaller farms into larger holdings.

The numbers of persons employed in the other occupations—that is, other than in management and labouring—were much smaller and in total only accounted for just over 11% of all jobs in the industry in 1996.

The following table shows the numbers employed by occupational group in 1987 and 1996 in the sector. Note that this table uses the older occupational classification (Australian Standard Classification of Occupations [ASCO] first edition), while the table in the section on the qualifications profile above uses the latest classification.

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Table 1.5: Shifts in employment by occupational group ('000s), 1987–1996, agriculture, forestry and fishing

	Managers	Professionals	Para-prof.	Trades	Clerks	Sales/personal service	Plant op/ drivers	Labourers	Total
1987	258.8	2.1*	8.0	17.1	11.0	1.0*	9.1	106.8	413.8
1996	238.4	3.1*	9.4	16.1	16.3	3.2*	12.1	127.6	426.2
Change	**–20.4**	**1.0***	**1.4**	**–1.0**	**5.3**	**2.2***	**3.0**	**20.8**	**12.4**

Note: *Subject to sampling variability too high for most practical uses

Source: ABS, *Labour force, Australia*, cat.6203.0, 1987, 1996

Despite the current small numbers of skilled workers in the industry, fewer employers in the sector believe that there are sufficient numbers of VET graduates to meet current needs than in any other sector. At the 1997 ESS, only 56% of employers in agriculture, forestry and fishing said there were sufficient graduates, compared with an all-industry rating of 67%.

The occupations most frequently identified as being in shortage by the employers, however, were the relatively small areas of tradespersons and sales and personal service workers which, together, account for less than 5% of the workforce in the sector. Nevertheless, the third most frequent area of shortage, identified by nearly 30% of respondents, was in labouring.

Further investigation of this response would be worthwhile to determine whether the shortage perceived relates to:

- specific skills normally required of farm labourers
- changing technologies not being addressed by current training
- a change in the mix of activities within the sector which might indicate retraining is required
- geographic factors reflecting the changing land use patterns, or
- seasonal work, such as fruit picking

The national industry training advisory body (ITAB) covering agriculture and horticulture, the Rural Training Council of Australia Inc., reported to ANTA in 1997 on skill shortages in their area of coverage. They said:

> *Skill shortages have been identified in specific areas of the industry including: shearers—to replace high departure levels; shedhands—are in constant short supply; agricultural machinery operators—particularly in cane-haul-out and grain harvesting; maintenance and repair technicians for agricultural machinery are in serious shortage for seasonal harvesting; agricultural and horticulture farm managers; amenity horticulture operators—in expectation of needs for the Sydney Olympics; agriculture and horticulture farmers and farm operators—qualified in chemical use and best practice occupational health and safety provisions; functional literacy and numeracy for many in the industry; agriculture and horticulture operators—skilled in marketing export or commodity trading or computing and information technology, or environmental management practices, or skilled as trainers and workplace assessors.*

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The national ITAB covering forestry, the Forest and Forest Products Employment Skills Company Ltd (FAFPESC), reported to ANTA in 1997 that:

> *. . . national skill shortages have been identified in two major areas. There is a shortage of fitters, with basic mechanical, hydraulic or pneumatic fitting skills. This is caused by restructuring of timber mills and the expectation that operators will be able to perform basic machine maintenance. Generic skills, such as communication, literacy, numeracy and the ability to work with others, have been identified by industry as being in short supply. This is attributed to the lack of suitable, flexible, industry-specific training.*
>
> *Regional surveys in the north coast area of New South Wales, north-east Tasmania and the south-west of Western Australia indicate a significant shortage of supervisors (recruited or promoted). This is due to the lack of availability of skilled workers, exacerbated by limited industry-specific training. Other regional shortages identified by industry surveys include the areas of drying and preserving timber; saw doctoring; timber handling, grading and stock control; and product knowledge.*

Hours of work and earnings

The distribution of jobs in agriculture, forestry and fishing between part-time and full-time jobs is close to the overall average for all employment. In November 1997 about 78% of the jobs in the industry were full time and about 22% were part time, compared with the whole workforce split of about 75:25.

Agriculture, forestry and fishing is also characterised by having the highest proportion of its workforce working long hours. In all, 46% of workers in the industry averaged 49 hours or more weekly.

The industry also has the highest average hours worked per week. In 1997 the average male worker in the sector worked for 52.9 hours, against an average for males in all industries of 40.6 hours. Average hours for females were 31.5 hours against an all-industry average of 29 hours. The average for all persons was 46.5 hours against an all-industry average of 35.6 hours.

The following table summarises the distribution of full-time and part-time work in the industry.

Table 1.6: Employment in agriculture, forestry and fishing, by sex and hours worked, November 1997

	Full-time		Part-time		Total	
	No. ('000s)	%	No. ('000s)	%	No. ('000s)	%
Males	287.3	80.3	33.8	33.7	321.1	70.1
Females	70.3	19.7	66.5	66.3	136.8	29.9
Total	**357.6**	**100.0**	**100.3**	**100.0**	**457.9**	**100.0**

Source: ABS, *Labour force, Australia*, cat.6203.0, November, 1997

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Geographical distribution of agriculture, forestry and fishing

The following table shows that the larger States, New South Wales and Victoria, and the two Territories have a relatively low share of employment in agriculture, forestry and fishing, while the other States, particularly Tasmania, are relatively more dependent upon the sector.

Table 1.7: Employment in agriculture, forestry and fishing by State/Territory, August 1995

	No. employed in agriculture, forestry and fishing		Share of total employment in all industries
	('000)%	%	
NSW	111.0	27.4	33.5
Vic	90.9	22.5	25.0
Qld	86.1	21.3	18.3
SA	47.4	11.7	8.0
WA	51.0	12.6	10.1
Tas	15.0	3.7	2.4*
NT	2.4*	0.6	1.0*
ACT	0.6*	0.1	1.9*
Australia	**404.4**	**100.0**	**100.0**

Note: *Subject to sampling variability too high for most practical uses

Source: ABS, *Labour force, Australia*, cat.6227.0, 1995

- Agriculture, forestry and fishing is typically an industry with a relatively old, Australian-born male workforce, working long hours.
- It has the least formally qualified workforce of all industries in Australia, with only about one-third of the industry's workforce having a post-school qualification.
- The industry is of considerable national importance, contributing relatively more to GDP in Australia than in most OECD countries.
- The industry has achieved above-average growth in productivity over recent decades.
- Employment in the sector, contrary to popular belief, has been growing slowly in recent years.

Training in agriculture, forestry and fishing

As noted earlier, the ABS did not include this sector in the employer training expenditure survey, so it is difficult to provide informed comments on the degree to which the industry contributes to meeting its own skill needs. Another unknown is the degree to which informal training is provided by suppliers of agricultural machinery and chemicals.

Government support for training

ANTA has estimated that in 1996 the primary industry sector received about 22 hours of government-funded training per employed person in the industry. This was a little below the overall average of 27 hours per employed person for all industries. This represented about 4.7% of total government-funded training activity.

In 1996, 6.2% of all course enrolments in Australian VET were in the field of land and marine resources and animal husbandry.[6] More than a quarter, 27%, of these enrolments were in non-award courses, a much higher use of non-award courses than across the whole VET sector, where such enrolments constituted about 18%. Of the enrolments in this field of study, only 3.3% were in advanced diploma, diploma or associate diploma level courses compared with over 12% of enrolments in all VET courses at these levels. Again, this pattern of enrolments reflects the generally low level of qualifications held by workers in the sector, and it appears that the pattern is not changing.

Students enrolled in land and marine resources and animal husbandry were also grouped in lower-level courses when categorised by 'stream of study', a classification that relates to the occupational intent of the course. Nearly 48% of students in land and marine resources and animal husbandry were enrolled in either a basic employment skills course or a course aimed at industry operatives. Only about 38% of all students were enrolled in such courses.

Another worrying feature of VET enrolments related to the industry was the relatively high rate of withdrawal from courses pertinent to the sector. In 1996 over 13% of module enrolments in the agriculture and renewable resources discipline group concluded as withdrawals. Across the board, fewer than 10% of module enrolments resulted in withdrawals. The overall pass rate in the agriculture and renewable resources group was about 58%, two percentage points below average.

In the 1997 ESS compiled by the National Centre for Vocational Education Research (NCVER), agriculture, forestry and fishing appeared to be a relatively significant employer of former trainees (26% of employers in the industry surveyed employed a recent completer of a traineeship) and also a significant employer of graduates in most other categories. By contrast, the industry was a relatively low employer of former apprentices.

[6] NCVER, *Australian vocational education and training statistics 1996: In detail*

Satisfaction with training

In the ESS, agriculture sector employers emerged as among the industries more satisfied with VET and TAFE provision, with an overall satisfaction rating of 6.8 on a 10-point scale for both total VET and the TAFE part of VET.

Employers surveyed were asked to identify those areas of training delivery that they regarded as most in need of improvement. Agriculture sector employers identified increasing the relevance of course content and improving flexibility in delivery arrangements, such as times and locations of courses or, in this case, probably a need for improved distance education. The issue of flexible delivery appears, understandably, to be more important in this sector than in other industries.

The results of the 1997 TAFE GDS, also compiled by NCVER, provide a range of insights into training for agriculture and related areas. Data from that survey are available both according to the industry of employment of graduates and by the field of study undertaken. Unlike some other industry sectors, there is a field of study, land and marine resources and animal husbandry, which quite closely matches the training needs of the industry.

The 1997 GDS recorded 2.8% of graduates surveyed as working in the agriculture, forestry and fishing industry, similar to that recorded in the 1995 GDS (2.9%). In the 1997 survey, 3.9% of graduates had completed qualifications in the land and marine resources and animal husbandry field of study. There were about twice as many males as females graduating in this field of study.

When asked to relate the relevance of their studies to their employment, 47% of graduates working in the agriculture, forestry and fishing industry rated their course as 'highly relevant', a score at around the middle of the 17 industry sectors, while a further 27.3% rated the course of 'some relevance'.

VET graduates working in agriculture, forestry and fishing rated their course content well above the rating given by all graduates surveyed (see table 1.8). They were also happier with the information given to them when choosing their course although they were no happier than all graduates with the quality of information provided on careers and jobs available. Like all graduates, only 41% of the graduates working in agriculture, forestry and fishing gave a rating of 7 or more on a 10-point scale on this question. Graduates working in this industry were also more likely to give a lower rating to how well employers regarded their qualification. This outcome seems at odds with the relatively good rating for the sector in the ESS.

Employment outcomes

Graduates in the land and marine resources and animal husbandry field of study fared reasonably well in the labour market, with about 77% being employed when surveyed. This compared with an overall 71% of all graduates employed when surveyed.

The graduates working in the industry were most likely to have either a certificate (other) or an Australian Qualifications Framework (AQF) level II certificate. The next most common qualifications were a trade certificate and an AQF level III certificate. Those graduating in the land and marine resources and animal husbandry field of study mirrored this pattern of qualifications. To some extent, this qualifications profile understates the level of publicly funded qualifications, as the survey excludes the substantial number of graduates in New South Wales who attended agricultural colleges which are not part of the TAFE system in that State. The total government-funded effort referred to earlier does, however, include the training provided through these colleges.

At the time of the 1997 GDS, there were 1207 graduates working in the sector, of whom only 223 had not been employed before doing their course. There were 312 graduates from the land and marine resources and animal husbandry field of study unemployed, representing 3.4% of all unemployed graduates.

Incomes for graduates working in this sector were the fifth lowest out of the 17 industry sectors surveyed, at $421 per week for all workers. Full-time workers received on average $466, with male full-timers receiving $477 and females receiving $435. This male-female imbalance of $42 in full-time earnings was among the smaller income differentials when compared with the other industries surveyed. Only in retailing and accommodation were the differences noticeably less than this and, in a number of sectors, the gap between male and female *full-time* earnings was more than a hundred dollars, always in favour of males.

On the question of reasons for undertaking their course of study, graduates working in agriculture showed a different pattern of motivation than graduates in general. In fact, 36% of graduates said their main motivation was to get extra skills for their job. Fewer than 17% of all graduates gave this as their main motivation.

Apart from 'personal interest', the next main motivation was to get a job, with 17.6% of graduates in agriculture giving this as their motivation. Of all graduates, nearly 25% gave this as their motivation.

Graduates were asked to rate, on a 10-point scale, a number of aspects of their course. The following analysis compares the proportion, giving a score of 7 or better on the 10-point scale working in agriculture with all graduates.

From the following table it is clear that overall graduates in agriculture were well satisfied with their TAFE course. Several issues, however, stand out from table 1.8. TAFE graduates working in the industry were less likely than all graduates to believe that their qualification was well regarded by employers and less likely to believe that their qualification was useful in enhancing their job prospects.

Table 1.8: Rating of course by graduates employed in agriculture, forestry and fishing and all graduates

Issue	Agriculture, forestry and fishing %	All employed graduates %
Instructors' knowledge	89.5	85.2
Course content reflects industry practice	78.4	72.2
Presentation of material	78.8	73.2
Quality of equipment	70.1	62.2
Sufficient equipment	70.4	60.0
Info on choosing course	64.3	58.6
Info on careers/jobs	41.4	41.1
Usefulness for job prospects	69.9	71.8
Qualification well regarded by employers	60.9	64.9
Balance instruction and practice	78.0	69.8
Assessment method understood	80.8	78.5
Time/venue convenience	77.0	75.3
Overall course quality	89.3	84.1

Source: NCVER 1997, TAFE graduate destination survey, unpublished data

Whether this outcome results from a lack of regard for formal qualifications in the industry or from inherent shortcomings in the qualifications is difficult to judge. Nevertheless, the high scores given to other aspects of their course leads to the conclusion that while the graduates appreciated their formal learning experience, they do not believe that the industry is yet sufficiently appreciative of formal training.

Employer support for training

A moderately high 58% of students working in agriculture had received some form of support from their employer during their final semester of study, most commonly having their fees paid or receiving paid time off work. This compared with an overall figure of 51% for all graduates who were employed during their final semester. This suggests that employers in the sector are making at least some contribution to training for their industry.

Apprenticeships and traineeships have not figured prominently in this sector, although over the last few years there have been, on average, about 3300 apprentices throughout Australia in the horticulture industry.[7]

As noted earlier, this industry was not included in either ABS survey, the training expenditure survey or the training practices survey.

[7] NCVER, Australian training statistics, September 1997 data collection

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- Enrolments in courses related to agriculture appear tilted towards lower-level awards.
- There is an above-average attrition rate from courses in this industry.
- Employers in the industry appear quite satisfied with VET provision but naturally see the expansion of flexible and remote delivery as a high priority for improvement in the system.
- Employer support for training appears to be quite high but there are data deficiencies.
- Graduates working in the industry rated their TAFE course quite highly but did not think their qualifications were as well regarded as graduates working in other industries.

Some training issues in agriculture, forestry and fishing

- Data on training are more limited in this industry than elsewhere, especially in relation to employer needs and their contribution to training.
- There appear to be major emerging issues related to the older age structure of this industry and the low level of formal skills held by its workforce.
- Problems requiring immediate attention involve the broad issue of how new technologies being developed in the industry can be quickly and effectively disseminated to a geographically dispersed industry with low levels of current formal qualifications.

The following issues have been identified by the national ITABs as key emerging issues in training for the industry:

- The geographic isolation and nature of work in the industry necessitates vocational education being workplace based and supported by flexible distance learning arrangements.
- There is a need for formal evaluation of the effectiveness and consistency of the new training system.
- There is a need for a multi-industry, multi-media marketing campaign to target industry-specific groups about training packages and a continuing need for the products of research and development within the industry to be widely distributed using user-friendly formats.

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- The forestry ITAB noted that:

  > *. . . regional and community involvement in training has the potential to enhance quality outcomes for industry, but there are some possible problems. There is, for example, the danger of duplication of effort and physical resources, which could mitigate against consistency in outcomes, reducing the portability of qualifications. While the industry supports user choice in training delivery, it should not be forgotten that there may be substantial benefits and economies to be achieved through an industry-wide position as opposed to local or regional arrangements.*

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Appendix

The following table is extracted from the ANTA resource allocations for 1997 document, available at their website. It shows the planned allocations of government-funded training between the ANTA-defined 'training areas' in terms of 'annual hours curriculum' (AHC).

Table A1.1: Key national shifts in activity between 1996 revised estimates and 1997 projected activity (AHC '000s)

Industry training area	1996 revised	1997 projected	Total increase	Total increase as % of 1996 revised	% of overall increase
Category A					
Arts, Entert, Sports and Rec	11 408	11 928	520	4.6	5.5
Automotive	8 221	8 576	355	4.3	3.7
Building and Construction	18 785	19 009	224	1.2	2.4
Comm Services, Health and Ed	20 910	22 382	1 471	7.0	15.5
Finance, Banking and Insurance	3 420	3 468	48	1.4	0.5
Food Processing	2 454	2 851	396	16.1	4.2
TCF and Furnishings	5 714	5 813	100	1.7	1.0
Communications	1 883	1 963	80	4.3	0.8
Engineering and Mining	15 654	16 607	952	6.1	10.0
Primary Industry	11 874	12 217	343	2.9	3.6
Process Manufacturing	397	479	82	20.6	0.9
Sales and Personal Service	6 527	6 752	225	3.4	2.4
Tourism and Hospitality	16 707	18 151	1 444	8.6	15.2
Transport and Storage	1 686	1 851	164	9.8	1.7
Utilities	11 898	12 145	247	2.1	2.6
Category B					
Business and Clerical	42 412	43 117	705	1.7	7.4
Computing	11 969	12 641	672	5.6	7.1
Science, Technical and Other	6 727	6 870	143	2.1	1.5
Category C					
Gen Education and Training	40 046	41 212	1 166	2.9	12.3
Unallocated	622	779	157	25.2	1.6
Total	**239 316**	**248 810**	**9 494**	**4.0**	**100.0**

Note: TCF – textiles, clothing and footwear

Source: Publications, *ANTA Resource Allocations 1997*, <www.anta.gov.au>

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Table A1.2: Employed persons by occupation in agriculture, forestry and fishing

Occupation (ASCO 4-digit)	1987 ('000s)	1996 ('000s)	Change 1987 to 1996 ('000s)	Change 1987 to 1996 Average annual %
1401 Farmers and farm managers	257.6	235.3	–22.3	–1.0
3305 Ship's pilots and deck officers	4.7	5.4	0.0	1.6
4929 Sheep shearers	8.3	6.7	–1.6	–2.4
5301 Accounting clerks	7.7	13.8	6.1	6.9
7209 Agricultural plant operators	3.4	3.6	0.2	0.7
8199 Other trades assistants and factory hands	0.9	4.0	3.1	18.6
8201 Farm hands and assistants	83.5	94.9	11.4	1.5
8203 Forestry labourers	5.2	4.3	–0.9	–2.1
8205 Nursery and garden labourers	4.0	9.5	5.5	10.4
8925 Fishermen/women deckhands and seamen/women	7.0	5.9	–1.1	–1.9
Other occupations	31.5	42.8	11.3	3.6
Total all occupations	**413.8**	**426.2**	**12.4**	**0.3**

Note: As estimates of less than 3500 are subject to high statistical error, they are listed against specific occupations only where there was a higher estimate in either 1987 or 1996. Where estimates of less than 3500 were recorded for both 1987 and 1996, they are included in the 'other occupations' category

Source: ABS, Labour force survey, unpublished data

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Table A1.3: Educational attainment of employed persons by industry, occupation (1-digit ASCO) and type of post-school qualification at 1996 Census

Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
ASCO code and occupation									
1 Managers and Administrators	8 895	7 945	3 903	18 014	5 766	44 523	11 653	135 508	191 684
2 Professionals	2 022	473	308	530	483	3 816	494	1 932	6 242
3 Associate Professionals	626	293	328	605	303	2 155	386	2 360	5 201
4 Tradespersons and Related Workers	475	355	405	3 610	698	5 543	1 249	10 531	17 323
5 Advanced Clerical and Service Workers	306	323	190	138	290	1 247	512	3 361	5 120
6 Intermediate Clerical, Sales and Service Workers	336	222	256	502	383	1 699	576	4 204	6 479
7 Intermediate Production and Transport Workers	281	186	249	3 084	737	4 537	1 436	16 596	22 569
8 Elementary Clerical, Sales and Service Workers	62	48	41	137	61	349	120	1 316	1 785
9 Labourers and Related Workers	1 341	901	1 140	5 097	1 802	10 281	3 998	49 165	63 444
0 Inadequately described	84	63	41	218	47	453	126	1 147	1 726
Not stated	45	45	12	124	42	268	392	2 097	2 757
Not applicable	–	–	–	–	–	–	–	–	–
Total	**14 473**	**10 854**	**6 873**	**32 059**	**10 612**	**74 871**	**20 942**	**228 517**	**324 330**

Source: ABS, 1996 Census of population and housing

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Table A1.4: Educational attainment of employed persons by industry, occupation (3-digit ASCO) and type of post-school qualification at 1996 Census

Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
ASCO code and occupation									
100 Managers and Administrators nfd	178	153	71	230	76	708	159	1 089	1 956
110 Generalist Managers nfd	0	0	0	0	0	0	0	0	0
111 General Managers and Administrators	167	71	25	63	29	355	44	274	673
119 Miscellaneous Generalist Managers	37	15	23	213	20	308	60	363	731
120 Specialist Managers nfd	15	6	4	3	5	33	4	23	60
121 Resource Managers	130	47	31	20	24	252	34	238	524
122 Engineering, Distribution and Process Managers	79	32	21	65	11	208	23	199	430
123 Sales and Marketing Managers	79	27	22	28	16	172	21	138	331
129 Miscellaneous Specialist Managers	158	25	19	28	15	245	15	65	325
131 Farmers and Farm Managers	8 054	7 569	3 687	17 365	5 570	42 245	11 293	133 119	186 657
200 Professionals nfd	63	5	0	3	7	78	4	24	106
210 Science, Building and Engineering Professionals nfd	0	0	0	0	0	0	0	0	0
211 Natural and Physical Science Professionals	982	102	117	134	84	1 419	121	622	2 162
212 Building and Engineering Professionals	93	16	23	51	4	187	12	61	260
220 Business and Information Professionals nfd	3	0	3	0	3	9	0	3	12
221 Accountants, Auditors and Corporate Treasurers	171	19	45	4	6	245	26	101	372
222 Sales, Marketing and Advertising Professionals	46	13	9	14	8	90	13	82	185
223 Computing Professionals	65	6	13	3	8	95	3	41	139
229 Miscellaneous Business and Information Profs	138	18	28	29	12	225	31	137	393
230 Health Professionals nfd	0	0	0	0	0	0	0	0	0
231 Medical Practitioners	3	0	3	0	3	9	3	0	12
232 Nursing Professionals	26	31	0	3	12	72	12	25	109
238 Miscellaneous Health Professionals	121	3	0	0	0	124	4	5	133
240 Education Professionals nfd	3	0	0	0	0	3	0	3	6
241 School Teachers	78	27	20	6	7	138	14	112	264

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Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
242 University and Vocational Education Teachers	17	4	0	3	3	27	3	8	38
249 Miscellaneous Education Professionals	31	12	3	6	8	60	5	47	112
250 Social, Arts and Miscellaneous Professionals nfd	0	0	0	0	0	0	0	0	0
251 Social Welfare Professionals	27	12	7	7	5	58	7	26	91
252 Miscellaneous Social Professionals	48	0	3	3	0	54	0	13	67
253 Artists and Related Professionals	28	10	3	11	3	55	9	56	120
254 Miscellaneous Professionals	87	196	32	253	314	882	228	568	1 678
300 Associate Professionals nfd	3	3	3	0	6	15	5	23	43
310 Science/Engineering and Related Assoc Profs nfd	11	3	12	4	7	37	4	18	59
311 Medical and Science Technical Officers	134	46	83	98	61	422	57	404	883
312 Building/Engineering Associate Professionals	19	3	26	45	3	96	14	44	154
320 Business and Administrative Assoc Profs nfd	0	0	0	0	0	0	0	0	0
321 Finance Associate Professionals	28	9	7	8	10	62	13	85	160
329 Miscellaneous Business/Admin Assoc Profs	177	84	83	85	94	523	115	770	1 408
330 Managing Supervisors (Sales and Service) nfd	0	0	0	3	0	3	0	6	9
331 Shop Managers	163	89	63	208	70	593	83	733	1409
332 Hospitality and Accommodation Managers	4	11	0	28	5	48	16	64	128
339 Miscellaneous Mngr. Supervisors (Sales and Service)	47	27	19	81	19	193	49	326	568
340 Health and Welfare Assoc Professionals nfd	0	0	0	0	0	0	0	0	0
341 Enrolled Nurses	3	0	3	0	7	13	3	3	19
342 Welfare Associate Professionals	3	3	0	0	0	6	4	5	15
349 Miscellaneous Health and Welfare Associate Profs	3	0	0	0	0	3	0	4	7
390 Other Associate Professionals nfd	0	0	0	0	0	0	0	0	0
391 Police Officers	0	0	0	0	0	0	0	0	0
399 Miscellaneous Associate Professionals	29	16	29	43	19	136	22	175	333
400 Tradespersons and Related Workers nfd	5	11	6	73	9	104	10	103	217
410 Mechanical/Fabrication Engineering Trades nfd	0	0	0	3	0	3	0	0	3

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Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
411 Mechanical Engineering Tradespersons	11	9	8	484	13	525	50	224	799
412 Fabrication Engineering Tradespersons	3	3	3	187	9	205	39	148	392
421 Automotive Tradespersons	0	0	7	422	5	434	30	196	660
431 Electrical and Electronics Trades	0	0	6	141	3	150	11	33	194
440 Construction Tradespersons nfd	0	0	0	0	0	0	0	3	3
441 Structural Construction Trades	4	0	0	221	3	228	31	87	346
442 Final Finishes Construction Trades	0	0	3	47	0	50	7	61	118
443 Plumbers	0	3	0	51	4	58	11	49	118
451 Food Tradespersons	28	34	16	89	38	205	73	622	900
460 Skilled Agricultural/Horticultural Workers nfd	0	0	0	0	3	3	0	0	3
461 Skilled Agricultural Workers	82	106	129	910	350	1 577	571	5 282	7 430
462 Horticultural Tradespersons	319	170	211	810	229	1 739	357	3 230	5 326
490 Other Tradespersons and Related Workers nfd	0	0	0	3	0	3	0	0	3
491 Printing Tradespersons	3	0	0	4	0	7	0	16	23
492 Wood Tradespersons	0	0	3	13	0	16	3	24	43
493 Hairdressers	0	0	0	18	0	18	0	5	23
494 Textile, Clothing and Related Trades	0	0	0	3	0	3	3	18	24
498 Miscellaneous Tradespersons and Related Wkrs	17	17	10	134	31	209	51	430	690
500 Advanced Clerical and Service Workers nfd	0	0	0	0	0	0	0	0	0
511 Secretaries and Personal Assistants	181	191	115	70	197	754	322	1 982	3 058
590 Other Advanced Clerical and Service Wkrs nfd	0	0	0	0	0	0	0	0	0
591 Advanced Numerical Clerks	124	132	73	64	91	484	184	1 360	2 028
599 Miscellaneous Advanced Clerical and Service Wkrs	0	0	3	4	3	10	5	19	34
600 Intermediate Clerical, Sales and Service Wkrs nfd	0	0	4	0	4	8	3	14	25
610 Intermediate Clerical Workers nfd	0	0	0	0	0	0	0	0	0
611 General Clerks	102	68	44	53	113	380	139	1 090	1 609

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Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
612 Keyboard Operators	11	11	16	14	30	82	29	201	312
613 Receptionists	8	8	12	12	19	59	25	195	279
614 Intermediate Numerical Clerks	32	18	31	12	35	128	41	309	478
615 Material Record and Despatch Clerks	16	3	11	44	15	89	15	265	369
619 Miscellaneous Intermediate Clerical Workers	36	13	19	32	13	113	26	136	275
621 Intermediate Sales and Related Workers	25	25	20	54	12	136	29	303	468
630 Intermediate Service Workers nfd	0	0	0	0	0	0	0	3	3
631 Carers and Aides	28	29	21	29	23	130	45	277	452
632 Hospitality Workers	3	3	6	7	9	28	11	113	152
639 Miscellaneous Intermediate Service Workers	67	44	72	244	110	537	214	1 297	2 048
700 Intermediate Production and Transport Wkrs nfd	3	3	8	52	7	73	28	337	438
710 Intermediate Plant Operators nfd	3	3	0	23	0	29	16	142	187
711 Mobile Plant Operators	66	61	94	890	172	1283	364	5 335	6 982
712 Intermediate Stationary Plant Operators	4	0	0	43	17	64	26	208	298
720 Intermediate Machine Operators nfd	33	23	33	287	70	446	145	1 857	2 448
721 Intermediate Textile/Clothing/Related Mach Ops	6	3	0	41	7	57	24	185	266
729 Miscellaneous Intermediate Machine Operators	0	3	3	59	3	68	19	317	404
731 Road and Rail Transport Drivers	17	17	19	559	41	653	181	2 490	3 324
790 Other Intermediate Prod'n and T'port Wkrs nfd	0	0	0	0	0	0	0	0	0
791 Intermediate Mining and Construction Workers	3	0	3	17	3	26	6	65	97
799 Misc Intermediate Prod'n and Transport Wkrs	149	77	88	1 113	415	1842	627	5 660	8 129
800 Elementary Clerical, Sales and Service Wkrs nfd	0	0	0	3	0	3	0	10	13
811 Elementary Clerks	7	0	3	3	9	22	11	105	138
820 Elementary Sales Workers nfd	0	0	0	3	0	3	0	0	3
821 Sales Assistants	27	21	19	47	26	140	33	473	646
829 Miscellaneous Elementary Sales Workers	6	3	3	35	10	57	24	188	269
831 Elementary Service Workers	20	22	17	49	16	124	52	538	714
900 Labourers and Related Workers nfd	25	11	13	57	24	130	106	1 075	1 311

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Agriculture, forestry and fishing	Bachelor degree or higher	Undergraduate diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	With qualifications	Inadequately described or not stated	Not applicable (no quals.)	Total
911 Cleaners	30	36	10	51	36	163	100	999	1 262
920 Factory Labourers nfd	0	0	0	3	0	3	0	9	12
921 Process Workers	28	9	20	151	58	266	140	1 579	1 985
922 Product Packagers	54	35	30	109	57	285	192	2 329	2 806
990 Other Labourers and Related Workers nfd	0	4	0	13	3	20	3	62	85
991 Mining, Construction and Related Labourers	33	18	11	208	40	310	101	1 287	1 698
992 Agricultural and Horticultural Labourers	1 157	772	1 045	4 373	1 557	8 904	3 286	41 204	53 394
993 Elementary Food Preparation and Related Wkrs	3	3	5	4	7	22	11	89	122
999 Miscellaneous Labourers and Related Workers	14	14	6	130	20	184	59	532	775
099 Inadequately described	84	63	41	218	47	453	126	1 147	1 726
Not stated	45	45	12	124	42	268	392	2 097	2 757
Not applicable	–	–	–	–	–	–	–	–	–
Total	**14 473**	**10 857**	**6 872**	**32 065**	**10 612**	**74 879**	**20 940**	**228 516**	**324 335**

Note: nfd – not further defined

Source: ABS, 1996 Census of population and housing

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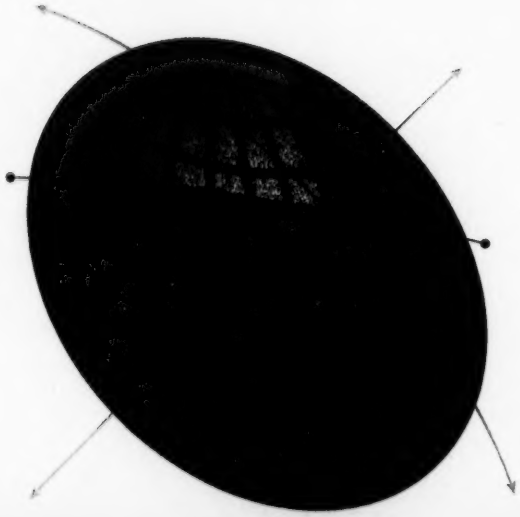

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